

## ABSTRACT OF THE DISCLOSURE

A controller for a multiphase converter including an error amplifier, a gain resistor, a current sense circuit and a gain adjust amplifier. The error amplifier generates an error signal based on an error voltage developed across a feedback resistance. The current sense circuit converts each of multiple sensed load currents into corresponding proportional voltages. The gain adjust amplifier circuit receives the proportional voltages and operates to apply at least one gain adjust voltage to the gain resistor to develop a gain adjust current that is applied through the feedback resistance to adjust gain. In one embodiment, the proportional voltages are time multiplexed or averaged to provide the gain adjust voltage(s). An IC integrating the multiphase converter need only include a single gain pin for coupling to a gain resistor to set gain for each phase.